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| 10/713,197 | 11/17/2003 | Ji-Young Moon | Q77283 | 9563 |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| | Application No. | Applicant(s) |
| --- | --- | --- |
| **Office Action Summary** | 10/713,197 | MOON, JI-YOUNG |
| | Examiner | Art Unit | |
| | Techane J. Gergiso  T.G | 2137 | |

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *30 April 2007*.

2a)☐ This action is **FINAL**.     2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-13* is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 6-13* is/are rejected.

7)☒ Claim(s) *2-5* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☒ All  b)☐ Some * c)☐ None of:

   1.☒ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)☒ Notice of References Cited (PTO-892)         4)☐ Interview Summary (PTO-413)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)         Paper No(s)/Mail Date. _____.
3)☐ Information Disclosure Statement(s) (PTO/SB/08)         5)☐ Notice of Informal Patent Application
   Paper No(s)/Mail Date _____.         6)☐ Other: _____.

## DETAILED ACTION

1.      This is a non–Final Office Action in response to the application filed on November 17,

2003.

2.      Claims 1-11 have been examined and are pending.

## Claim Rejections - 35 USC § 101

3.      35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4.      Claims 9 and 10 are rejected under 35 U.S.C. 101 because the claimed invention is

directed to non-statutory subject matter.

Claim 9 is directed to "a spatial masking method, comprising the steps of: adjusting

contrast of a moving image frame; and extracting edges from the contrast-adjusted frame." This

claimed subject matter lacks a practical application of judicial exception (law of nature, abstract

idea, naturally occurring article/phenomenon) since it fails to produce a useful, concrete and

tangible result.

Specifically, the claimed subject matter does not produce **a useful result** because

the **claimed subject matter fails to sufficiently reflect at least one practical utility** set

forth in the descriptive portion of the specification.   More specifically, while the

described practical utility is directed to "*providing a watermarking method, which inserts*

*a watermark into a moving image depending on a global masking method in which the*

*characteristics of respective masking methods are combined together in consideration of HVS and the present invention selects a combination method expressed by G=F+S+M Equation so as to apply global masking, in which frequency, spatial and motion masking effects are taken into consideration together, to an image; where G, F, S and M represent a global masking value, a frequency masking value, a spatial masking value and a motion masking value, respectively (disclosure 0006 and 0039)* " the subject matter relates ONLY to, **adjusting contrast of a moving image frame; and extracting edges from the contrast-adjusted frame.**

In addition, the claimed subject matter does not produce a **tangible result** because the claimed subject matter fails to produce a result that is limited to having a real world value rather than a result that may be interpreted to be abstract in nature as, for example, a thought, **a computation, or manipulated data.** More specifically, **the claimed subject matter provides adjusting contrast of a moving image frame, and extracting edges from the contrast-adjusted frame.** This produced result remains in the abstract and, thus fails to achieve the required status of having real world value.

Claim 10 is directed to "a motion masking method, comprising the steps of: obtaining a luminance difference between a current frame and a previous frame; and extracting edges from the current frame." This claimed subject matter lacks a practical application of judicial exception (law of nature, abstract idea, naturally occurring article/phenomenon) since it fails to produce a useful, concrete and tangible result.

Specifically, the claimed subject matter does not produce **a useful result** because the **claimed subject matter fails to sufficiently reflect at least one practical utility** set

forth in the descriptive portion of the specification. More specifically, while the described

practical utility is directed to *"providing a watermarking method, which **inserts a***

***watermark into a moving image depending on a global masking method in which the***

***characteristics*** *of respective masking methods are combined together in consideration of*

*HVS and the present invention selects a combination method expressed by* $G=F+S+M$

*Equation so as to apply global masking, in which* ***frequency, spatial and motion***

***masking effects are taken into consideration together, to an image;*** *where G, F, S and*

*M represent a* ***global masking value,*** *a frequency masking value, a spatial masking value*

*and a motion masking value, respectively (disclosure 0006 and 0039)* " the subject matter

relates ONLY to, **obtaining a luminance difference between a current frame and a**

**previous frame; and extracting edges from the current frame.**

Specifically, the claimed subject matter does not produce a tangible result because

the claimed subject matter fails to produce a result that is limited to having a real world

value rather than a result that may be interpreted to be abstract in nature as, for example,

a thought, **a computation, or manipulated data.** More specifically, **the claimed subject**

**matter provides obtaining a luminance difference between a current frame and a**

**previous frame; and extracting edges from the current frame.** This produced result

remains in the abstract and, thus fails to achieve the required status of having real world

value.

## *Response to Arguments*

5.    Applicant's arguments with respect to claims 1-13 have been considered but are moot in

view of the new ground(s) of rejection. However, the amendments to independent claims 9 and

10 are not persuasive nor substantial to overcome with regard to the 101 rejections.

## *Claim Rejections - 35 USC § 103*

6.    The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

7.    Claims 1, 6, 7, 8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Hannigan et al. (hereinafter referred to as Hannigan, US Pat No.: 6,535,617) in view of Tewfik et

al. (hereinafter referred to as Tewfik, US Pat. No.: 6,061,793)

As per claims 1 and 11:

Hannigan disclose a moving image watermarking method using a human visual system,

and A computer readable medium including program codes executable by a computer to perform

a moving image watermarking method using a human visual system, comprising:

a) obtaining a watermark value by exclusive-ORing a random key value and a binary

value of a logo image (Column 15: lines 13-30; Spread spectrum modulation);

b) separately performing a plurality of masking operations (column 10: lines 60-67;

column 11: lines 1-15)

    d) obtaining a watermarked frame value by adding a watermark value weighted by the

global masking value and a control variable to an original frame value (figure 8:

810; global gain; 3.4: Gain control and Perceptual Analysis; column 17: lines 26-

38.); and

    e) inserting a watermark into a moving image frame using the watermarked frame value

(column 8: lines 2-15; 2.1: Image Water Embedder; 3.0: Embedder

Implementation; column 14: lines 37-55);


Hannigan does not explicitly teach c) obtaining a global masking value through the

separate masking operations. Tewfik, in an analogous art teaches obtaining a global masking

value through the separate masking operations (column 3: lines 56-67; column 4: lines 53;

column 5: lines 54-67). Therefore, it would have been obvious to a person having ordinary

skill in the art at the time the invention was made to modify the method disclosed by Hannigan

to include obtaining a global masking value through the separate masking operations. This

modification would have been obvious because a person having ordinary skill in the art would

have been motivated by the desire to provide hiding of data, including watermarks, in human-

perceptible sounds, that is, audio host data and employ perceptual masking models to determine

the optimal locations within host data to insert the hidden data or watermark as suggested by

Tewfik in (column 2: lines 40-45).


As per claim 6:

    Tewfik disclose a watermarking method, comprising:

comparing an image quality of the watermarked frame with an image quality set to a

target (column 10: lines 12-25); and

decreasing a control variable by a predetermined value if the image quality of the

watermarked frame is less than the target image quality, and increasing the

control variable by a predetermined value if the image quality of the watermarked

frame is greater than the target image quality (column 12: lines 30-50).


As per claim 7:

Tewfik discloses a watermarking method, wherein the image quality is estimated on the

basis of Peak-Signal-to-Noise Ratio (PSNR) (column 5: line 35).


As per claim 8:

Hannigan disclose a watermarking method extracting the watermark, comprising the

steps of: subtracting the watermarked frame value from an original frame value to obtain a

subtracted result value; and exclusive-ORing the subtracted result value and a random variable

obtained by a key value, and obtaining an exclusive-ORed result (Column 15: lines 13-30;

Spread spectrum modulation).


8.      Claims 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kraft (US

Pat No.: 6, 954, 549) in view of Hannigan et al. (hereinafter referred to as Hannigan, US Pat No.:

6,535,617).

As per claim 9:

Kraft discloses a spatial masking method for use in watermarking a moving picture comprising the steps of: adjusting contrast of a image frame; and extracting edges from the contrast-adjusted frame (column 2: lines 6-15).

Kraft does not explicitly teach the frame is a moving image and a special masking. Hannigan, in an analogous art however teaches the frame is a moving image and a special masking (column 11: lines 20-65; 2.2 overview of a detector and reader). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the method disclosed by Kraft to include the frame is a moving image and a special masking. This modification would have been obvious because a person having ordinary skill in the art would have been motivated by the desire to provide a method of removing fixed pattern noise from a media signal as suggested by Hannigan in (column 1: lines 50-61).

As per claim 10:

Kraft discloses motion masking method for use in watermarking a moving picture comprising the steps of: obtaining a luminance difference between a current frame and a previous frame; and extracting edges from the current frame (column 2: lines 6-15)

Kraft does not explicitly teach a motion masking. Hannigan, in an analogous art however teaches teach a motion masking (column 11: lines 20-65; 2.2 overview of a detector and reader). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the method disclosed by Kraft to include teach a

motion masking. This modification would have been obvious because a person having ordinary skill in the art would have been motivated by the desire to provide a method of removing fixed pattern noise from a media signal as suggested by Hannigan in (column 1: lines 50-61).

As per claim 12 and 13:

The spatial masking method, comprising the extracted edges in a recording medium (recording a data in a medium would have been obvious to an ordinary skilled person in the art at the time of the invention).

## *Allowable Subject Matter*

9.      Claims 2-5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10.     The following is a statement of reasons for the indication of allowable subject matter: Conventional method of inserting a watermark into a Moving Picture Expert Group (MPEG)-2 bit stream cannot be applied to various bit rates or encoding methods, and is limited in the capacity of insert able watermark data due to a limitation in the bit rate thereof. A moving image watermarking method as it is, is problematic in that it does not take a correlation and motion change between moving image frames into consideration. It is important to maintain the invisibility of a watermark while maintaining the robustness thereof, a Human Visual System (HVS) has been generally used to insert a watermark into a region less sensitive to human eyes.

Conventional methods mainly use frequency masking characteristics to insert a watermark into a Discrete Cosine Transform (DCT) domain and these methods do not consider spatial localization characteristics, a watermark inserted into the DCT domain is spread over all frames, which causes a problem in that a watermark can even be inserted into a region with an insufficient masking effect, such as a uniform region.

The present invention to accomplish the above objects, is provides a moving image watermarking method using a human visual system comprising the steps of obtaining a watermark value by exclusive-ORing a random key value and a binary value of a logo image; separately performing a plurality of masking operations; obtaining a global masking value through the separate masking operations; and obtaining a watermarked frame value by adding a watermark value weighted by the global masking value and a control variable to an original frame value and separately performing a plurality of masking operations comprises the steps of performing a spatial masking operation; and performing a motion masking operation.

### *Conclusion*

11.    The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

See the notice of reference cited in form PTO-892 for additional prior art

## *Contact Information*

12.     Any inquiry concerning this communication or earlier communications from the examiner should be directed to Techane J. Gergiso whose telephone number is (571) 272-3784. The examiner can normally be reached on 9:00am - 6:00pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Emmanuel Moise can be reached on (571) 272-3865. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

$T$-$G$

Techane Gergiso

Patent Examiner

EMMANUEL L. MOISE
SUPERVISORY PATENT EXAMINER

Art Unit 2137

August 8, 2007